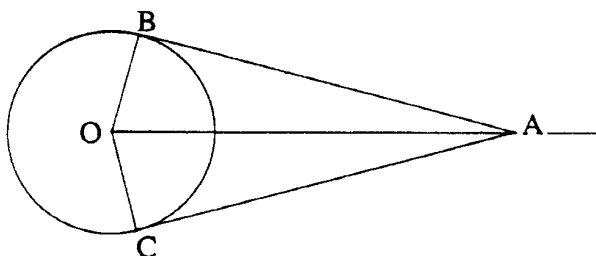# The Circle
Basic Skills

1. Find the equation of the tangent to the circle $x^2 + y^2 = 25$ at the point (-3,4).

2. Find the coordinates of the points where the line with equation $y = x + 1$ cuts the circle with equation $x^2 + y^2 = 5$.

3. Show that the line with equation $y + 5x = 10$ is a tangent to the circle with equation $x^2 + y^2 - 16x + 8y + 54 = 0$ and state the coordinates of the point of contact.

4. In the diagram AB and AC are the tangents from the point A(9,0) to the circle $x^2 + y^2 = 16$, with centre O. Find the area of the kite ABOC.

5. Find the image of the circle $x^2 + y^2 - 12x - 2y - 53 = 0$ under reflection in the line $y = x$.

6. Show that the line $x + y = 7$ touches the circle with equation $(x - 4)^2 + (y + 1)^2 = 8$.

7. Find the values of c for which the line $x - y = c$ is a tangent to the circle $x^2 + y^2 = 36$.

8. The circle whose equation is $x^2 + y^2 + 8x - 2y + k = 0$ touches the line $y + 2 = 0$. Calculate the value of k.

9. The centre of a circle lies on the line $2x + y = 0$. The lines $y = 1$ and $y = 7$ are tangents to this circle. Find the equation of the circle.

10. Show that the point $A(5,2)$ lies on the circle $x^2 + y^2 - 2x - 4y - 11 = 0$. Find the equation of the tangent to the circle at this point.

11. The tangent from the point $D(8,-2)$ touches the circle with equation $x^2 + y^2 + 2x - 4y + 1 = 0$ at the point T. Calculate the length of DT.

12. The line $y = x + k$ is a tangent to the circle $x^2 + y^2 - 12x + 28 = 0$. Find the possible values of k.

13. The line $y = mx + 5$ is a tangent to the circle $x^2 + y^2 = 16$. Find the possible values for m.

14. Show that the line $x + y = 10$ touches the circle $x^2 + y^2 - 2x - 10y + 18 = 0$ and find the coordinates of the point of contact.